

REMARKS

The Office Action of February 12, 2007 has been carefully reviewed and these remarks are responsive thereto. Reconsideration and allowance of the instant application are respectfully requested.

The abstract and claims are objected to for several informalities. A new abstract is attached hereto and does not use the term “comprising.” In addition, claim 1, as revised, addresses the objections noted in paragraph 2 of the Office Action. In particular, claim 1 has been revised to recite a conductive layer instead of a grounded metal plate. The term “antenna package” has been eliminated. Withdrawal of these objections is requested.

Claims 1-9 stand rejected under 35 USC 112, 2nd paragraph as being indefinite. For clarification, claim 1 has been revised to delete the term “antenna output,” “antenna package,” and “metal plate.” Claims 3 and 4 have been revised for clarification. In addition, in regard to “forming one quarter,” attention is drawn to Fig 1 showing antenna element 4 and Fig 3 showing portions of the antenna elements 4a and 5a. Each of these portions is $\frac{1}{4}$ of the whole element. Hence, the term is believed to be clear on its face. Withdrawal of the rejections under 112, second paragraph, is requested.

Claims 1-9 stand rejected under 35 USC 103(a) as unpatentable over Rothe (US 6,456,241) in view of Guler et al. (US 6,028,562).

Claim 1 is directed to an apparatus comprising
a plurality of conductive layers each conductive layer having a plurality of apertures,
a plurality of antenna feed mechanism layers disposed between the conductive layers, each including a plurality of excitation probes about aligned with the apertures and arranged as subarrays with alternating polarizations, the subarrays of a first antenna feed mechanism layer being juxtaposed with subarrays of a second feed mechanism layer with different polarizations,
the apparatus further including an amplification circuit for amplifying received signals and a combining block for combining received signals, the received signals being coupled to a Low Noise Block (LNB).

Figure 1 shows two antenna layers 4 and 5 adjacent conductive layers (grounded metal

plates) 1, 2, and 3. As shown in Fig. 3, antenna layer 4 contains eight subarrays such as subarray 4A and antenna layer 5 contains eight subarrays such as subarray 5A. Antenna layer 4 is mounted on top of antenna layer 5 (with conductive layer (plate) 2 and insulating layer 6 there-between). As shown in Fig 3, subarray 4A is mounted horizontally whereas subarray 5A is mounted vertically. This arrangement provides unique alternating orientations. That is, a first subarray is oriented in an orientation different from an orientation of the subarray under the first array. The subarrays further alternate in pairs between horizontal and vertical positions across antenna layer 4 and across antenna layer 5. Such alternating pairs of subarrays provide much better symmetry of the radiation pattern. Thus each subarray in antenna layer 4 has four rows of vertically oriented radiators, followed by four more rows of vertically oriented radiators, and corresponding pairs of subarrays in antenna layer 4 and antenna layer 5 have opposite orientations.

Antenna feed mechanism layers 4 and 5 include feed layers are 4D and 5D which are connected through striplines 4B and 5B, respectively. Feed layers 4D and 5D (which serve as excitation probes) combined with radiating apertures 1A form the radiating (antenna) element of the antenna array. As shown in Figure 3, the feed layers also include tapered and dual tapered radiating elements. See also Figure 5. The tapered radiating elements (or dual tapered radiating elements) provide increased bandwidth. See paragraphs [0029] and [0032] of the published application.

Neither Rothe nor Guler teach or suggest alternating subarrays as claimed in independent claims 1 and 11. Nor do Rothe and Guler teach or suggest the shape of radiating elements within the antenna layers as claimed in new independent claim 12. Withdrawal of this rejection is respectfully requested.

CONCLUSION

In view of the above amendment and remarks, this application is in condition for allowance.

If additional fees are due in connection with this paper, the Assistant Commissioner is authorized to debit our deposit account no. 19-0733 in the appropriate amount. Applicants respectfully solicit favorable consideration and allowance of the instant application. If there are any questions, the Examiner is invited to contact the undersigned to further prosecution.

Respectfully submitted,

Date: May 31, 2007

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APPENDIX